

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference 004900.00022	FOR FURTHER ACTION		See item 4 below
International application No. PCT/US2004/023502	International filing date (<i>day/month/year</i>) 22 July 2004 (22.07.2004)	Priority date (<i>day/month/year</i>) 22 July 2003 (22.07.2003)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant KABUSHIKI KAISHA TOSHIBA			

- This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis* 1(a).
- This REPORT consists of a total of 19 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.
- This report contains indications relating to the following items:

<input checked="" type="checkbox"/> Box No. I	Basis of the report
<input checked="" type="checkbox"/> Box No. II	Priority
<input type="checkbox"/> Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input checked="" type="checkbox"/> Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/> Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input checked="" type="checkbox"/> Box No. VI	Certain documents cited
<input type="checkbox"/> Box No. VII	Certain defects in the international application
<input type="checkbox"/> Box No. VIII	Certain observations on the international application
- The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 740 14 35	Date of issuance of this report 23 January 2006 (23.01.2006)
	Authorized officer Beate Giffo-Schmitt Telephone No. +41 22 338 87 20

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

REC'D 06 JUL 2005

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To:

see form PCT/ISA/220

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/US2004/023502

International filing date (day/month/year)
22.07.2004

Priority date (day/month/year)
22.07.2003

International Patent Classification (IPC) or both national classification and IPC
H04L12/28, H04L29/06, H04Q7/38

Applicant
KABUSHIKI KAISHA TOSHIBA

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☒ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1b(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2004/023502

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

Box No. II Priority

1. ☐ The validity of the priority claim has not been considered because the International Searching Authority does not have in its possession a copy of the earlier application whose priority has been claimed or, where required, a translation of that earlier application. This opinion has nevertheless been established on the assumption that the relevant date (Rules 43bis.1 and 64.1) is the claimed priority date.
2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43bis.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

see separate sheet

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2004/023502

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA206) to pay additional fees, the applicant has:
- ☒ paid additional fees.
 - ☐ paid additional fees under protest.
 - ☐ not paid additional fees.
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- ☐ complied with
 - ☒ not complied with for the following reasons:
see separate sheet
4. Consequently, this report has been established in respect of the following parts of the international application:
- ☒ all parts.
 - ☐ the parts relating to claims Nos.

Box No. V Reasoned statement under Rule 43b/is.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-8,10,12-21,26,31
	No: Claims	9,11,22-25,27-30
Inventive step (IS)	Yes: Claims	1-8,13-21,26,31
	No: Claims	9-12,22-25,27-30
Industrial applicability (IA)	Yes: Claims	1-31
	No: Claims	

2. Citations and explanations

see separate sheet

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2004/023502

Box No. VI Certain documents cited

1. Certain published documents (Rules 43*bis*.1 and 70.10)
and / or
2. Non-written disclosures (Rules 43*bis*.1 and 70.9)
see form 210

Concerning Section I.
Basis of the report

Reference is made to the following documents, which are cited in the International Search Report:

- D1: US 2002/075812 A1 (CORWIN SUSAN JULIA) 20 June 2002 (2002-06-20)
- D2: MAHONEN P ET AL: "PLATFORM-INDEPENDENT IP TRANSMISSION OVER WIRELESS NETWORKS: THE WINE APPROACH" IEEE PERSONAL COMMUNICATIONS, IEEE COMMUNICATIONS SOCIETY, US, vol. 8, no. 6, December 2001 (2001-12), pages 32-40, XP001076793 ISSN: 1070-9916
- D3: US 2003/007475 A1 (TSUDA YOSHIYUKI ET AL) 9 January 2003 (2003-01-09)
- D4: US 2002/026527 A1 (DAS SUBIR ET AL) 28 February 2002 (2002-02-28)
- D5: EP-A2-1 381 202 (BIRDSTEP TECHNOLOGY ASA) 14 January 2004 (2004-01-14)
- D6: EP-A2-0 998 094 (NOKIA CORPORATION) 3 May 2000 (2000-05-03)
- D7: US 2003/1 17978 A1 (HADDAD WASSIM) 26 June 2003 (2003-06-26)
- D8: WO 01/31472 A1 (TELCORDIA TECHNOLOGIES, INC; TOSHIBA AMERICA RESEARCH, INC) 3 May 2001 (2001-05-03)
- D9: WO 03/065654 A1 (KONINKLIJKE PHILIPS ELECTRONICS N.V; MELPIGNANO, DIEGO) 7 August 2003 (2003-08-07)
- D10: US 2002/049059 A1 (SOININEN JONNE ET AL) 25 April 2002 (2002-04-25)
- D11: EP-A-0 964 597 (NIPPON TELEGRAPH AND; NTT MULTIMEDIA COMMUNICATIONS LABORATORIES INC) 15 December 1999 (1999-12-15)
- D12: US 2004/073642 A1 (IYER PRAKASH N) 15 April 2004 (2004-04-15)
- D13: US 2004/103311 A1 (BARTON MELBOURNE ET AL) 27 May 2004 (2004-05-27)
- D14: WO 02/42861 A2 (ECUTEL) 30 May 2002 (2002-05-30)
- D15: US 2002/069278 A1 (FORSLOEW JAN) 6 June 2002 (2002-06-06)
- D16: GUPTA V., MONTENEGRO G., SUN MICROSYSTEMS INC: "Secure and mobile networking" MOBILE NETWORKS AND APPLICATIONS 3, 1998, pages 381-390, XP002280108

D17: MONTENEGRO G ET AL: "Sun's SKIP Firewall Traversal for Mobile IP"
RFC2356, June 1998 (1998-06), XP002171034

Concerning Section VI.

Certain documents cited:

Certain published documents (see Rule 70.10 PCT)

Application No Patent No	Publication date (day/month/year)	Filing date (day/month/year)	Priority date (valid claim) (day/month/year)
D5=EP-A2-1 381 202	14.1.04	10.7.03	11.7.02
D9=WO03/065654 A1	7.8.03	24.1.03	29.1.02
D12=US2004/073642 A1	15.4.04	30.9.02	-
D13=US2004/103311 A1	27.5.04	27.11.02	-

Concerning Section II.

Priority of the international application

The first priority document with filing date 22.7.03 deals with a network configuration comprising a Intranet, a firewall, a secure mobile gateway in the demilitarized zone and an external network, wherein several message flows, tunnel scenarios, security aspects and a state diagram are described with regard to roaming between virtual private network and external network.

However, it fails to disclose any details with regard to roaming between networks of different air interfaces, and it also does not deal with implementation details, in particular with system components like mobile IP drivers, network drivers, trigger packet queues, controllers. (These aspects have first been disclosed in the second priority document with filing date 21.7.04!).

Therefore, the documents D5, D9, D12 and D13 indicated in the International Search Report as P-documents are regarded as state of the art according to Articles 33(2) and (3) PCT for the Claims relating to the 1., 2. and 3. inventions as indicated below,

as the date of priority claimed cannot be allowed for these parts of the present application (see Rule 64.1 b) PCT).

However, these documents are not (see Rule 64.3 PCT) to be regarded as state of the art according to Articles 33(2) and (3) PCT for the 4. group of inventions as indicated below, as the date of priority claimed can be allowed for this part of the present application (see Rule 64.1 b) ii) PCT). (Nevertheless, they may become of certain relevance for the fourth invention also when entering into the national phase (e.g. see Article 54(3) EPC)).

Concerning Section IV.

Lack of unity of invention

- 1 The application lacks unity within the meaning of Rule 13.1 PCT, which states that a plurality of independent claims must relate to one single invention or to a group of inventions so linked as to form a single general inventive concept.
- 2 The set of claims relate to separate ideas which are not so linked as to form such a single general inventive concept, namely:
 - 2.1 The first invention (**Claims 1-4**) relates to a software architecture (e.g. for UNIX or Windows) enabling that an application can communicate in parallel via a first network and via a second network, whereby the mobility in both networks is managed separately, which is solved by providing:
 - an internal mobile IP driver connected to a first network driver,
 - an external mobile IP driver connected to said first network driver and a second network driver,
 - wherein an application communicates with said first network through said first network driver and communicates with said second network through said second network driver.
 - 2.2 The second invention claimed by **Claims 5-12** deals with the problem of to enable a

mobile terminal to seamless roam between a first and a second network. This is achieved by:

- establishing a first network connection between a first network driver of said mobile terminal and said first network,
- establishing a second network connection between a second network driver of said mobile terminal and said second network,
- transitioning communications from said first network to said second network.

Remark:

Claim 5 deals with an appliance of the software architecture of Claim 1 to perform the method according to the second invention.

- 2.3 The third claimed invention (**Claims 13-21**) concerns two embodiments for enabling switching between a double tunnel and a triple tunnel, for instance for switching between a secure connection applying an IPsec tunnel and an insecure connection without an IPsec tunnel to a home network,

either by (**Claims 16-21**):

- receiving a packet,
- determining if said packet is a trigger packet,
- storing said packet in a trigger packet queue, and
- switching between said double tunnel and said triple tunnel;

or by (**Claims 13-15**):

- an external mobile IP driver receiving information from a first network driver,
- an internal mobile IP driver receiving information from said external mobile IP driver,
- a controller that controls signaling for switching between a double tunnel and a triple tunnel,
- wherein said internal mobile IP driver determines whether said information is an indication that the mobile node should switch from a double tunnel to a triple tunnel and provides data to said controller regarding said indication.

- 2.4 The **Claims 22-31** concern security aspects for a connection between a mobile node and an internal home agent.

The first subinvention (**Claims 22, 23, 27, 28**) of this group prevents a denial of service attack by:

- a mobile node communicating with an internal home agent that only transmits internal mobile IP registration requests through an IPsec tunnel.

The second subinvention (**Claims 24, 25, 29, 30**) of this group prevents leakage of information by:

- a mobile node communicating with an internal home agent,
- wherein an internal mobile IP registration reply is not encrypted and at least some other signaling and data packets are encrypted.

The third subinvention (**Claims 26, 31**) of this group prevents false incoming calls from a mobile node communicating with an internal home agent, by:

- said mobile node including a firewall preventing packets from being accepted as trigger packets, where said trigger packets permit said mobile node to establish an IPsec tunnel with said internal home agent.

- 2.5 Since mobile nodes comprising several network drivers are known in the art (see e.g. D2, page 33, figure 1, page 34, figure 2, page 35, lines 14-21, see D1, paragraph 38), a single inventive concept defined by same or corresponding special technical features in the sense of Rule 13.2 PCT cannot be found in the present claims. Thus, the requirements of Rule 13.1 PCT are not met.

Concerning Section V.

Reasoned statement with regard to novelty, inventive step or industrial applicability

1 First invention (Claims 1-4)

1.1 Technical field

The first invention deals with a system for roaming between a first and a second network (**Claim 1**).

1.2 State of the art

Document D1 is considered to represent the closest state of the art. It shows a such a system consisting of a home network, a home service host with a home agent between two firewalls in a demilitarized zone between the home network and an IP based network. For enabling access of a mobile node via IP based networks of different technology like for instance GSM, GPRS, Bluetooth, WLAN,...), the mobile node comprises hardware and software communication media interfaces, corresponding drivers, and an IP-encapsulation software, and it registers with the home agent for creating a bidirectional mobile IP tunnel through a selected network type.

D2 discloses an architecture for a wireless node comprising a wireless device driver layer and a wireless adaption layer (WAL), which comprises a link layer control translator associated with each wireless device driver (WLAN, Bluetooth, Hiperlan,...), a QoS module, a WAL coordinator and several other modules. For each packet to be sent, the WAL selects the modules and translator to be used based on the class of traffic.

D3 describes a mobile node software architecture with a mobile IP driver between a network driver and a TCP-IP driver.

D4 discloses a mobile node which registers both locally in a network and globally by registering with a local care of address at a tunnelling agent in the actual network, and with the tunnelling agent address as care of address at the home agent in the home network.

1.3 The technical problem

The problem solved by the first claimed invention can be formulated as to enable parallel communication via two networks.

1.4 The invention

According to Claim 1, this problem is solved by:

- an internal mobile IP driver connected to a first network driver,
- an external mobile IP driver connected to said first network driver and a second network driver,
- wherein an application communicates with said first network through said first network driver and communicates with said second network through said second network driver.

Although the available prior art shows mobile nodes with one mobile IP driver connected to several network drivers, and the skilled person knows from D4 the principle of applying two mobile IP software modules in a mobile node, there is presently no document at hand which renders the claimed solution of connecting a second mobile IP driver to another network driver than those connected to a first mobile IP driver obvious to a person skilled in the art.

Remark:

Document D5 cited in section VI implicitly discloses that an inner mobile IP driver as well as an outer mobile IP driver can be connected to each network driver. However, it also fails to show or suggest the claimed parallel connection and communication.

Therefore, the claimed subject-matter of independent **Claim 1** and that of its dependent **Claims 2-4** is considered to be novel, inventive and industrially applicable according to Articles 33(2), (3) and (4) PCT.

2 Second invention (Claims 5-12)

- 2.1 The present application does not meet the requirements of Article 33(2) PCT, because the subject-matter of **Claim 9** is not novel.
- 2.2 The document D6 is regarded as being the closest prior art to its claimed subject-matter, and discloses a method for a mobile terminal to roam between a first and a second network (see D6, column 15, lines 45-52, column 16, lines 7-10) comprising the steps of:
- establishing a first network connection between a first network driver of said mobile

terminal and said first network (see D6, column 11, lines 42-46, column 12, lines 40-43, 49 - column 13, line 3),

- establishing a second network connection between a second network driver of said mobile terminal and said second network (see D6, column 11, lines 41f, 44-46, column 16, lines 10-13, 16-21),
- transitioning communications from said first network to said second network (see D6, column 16, lines 13-16, 21-28).

- 2.3 Accordingly all features of independent Claim 9 are known from D6 and its claimed subject-matter is thus not novel within the meaning of Article 33(2) PCT.
- 2.4 For the same reasons, the independent **Claim 11**, which corresponds for the apparatus category to independent method Claim 9, lacks novelty in the sense of Article 33(2) PCT for the same reasons.
- 2.5 Independent **Claim 5**, which deals with an appliance of the software architecture of Claim 1 (first invention) to perform the method of Claim 9 (second invention), appears to meet the requirements of Article 33(2), (3) and (4) for the same reasons as indicated in paragraph 1.4 above, which implies that its dependent **Claims 6-8** equally meet these requirements of the PCT.
- 2.6 The dependent **Claims 10 and 12** do not appear to contain any additional feature which, in combination with the features of the claim to which they refer, meet the requirements of the PCT with respect to inventive step, the reasons being that their features have already been employed for the same purpose in the prior art (see D1, paragraphs 15, 44, see D9, page 22, line 30 - page 23, line 3) or consist of slight constructional changes which come within the scope of the customary practice followed by persons skilled in the art.
- 2.7 Since the subject-matter of **Claims 9-12** is already industrially applied in D6 or is already suggested by combinations of the documents D6 and D1, the requirements of Article 33(4) PCT are fulfilled.

3 Third invention (Claims 13-21)

3.1 Technical field

The third invention deals with two embodiments (respective **Claims 13 and 16, 19**) for enabling switching between a double tunnel and a triple tunnel, for instance for switching between a secure connection applying an IPsec tunnel and an insecure connection without an IPsec tunnel to a home network, or for switching a secure connection in an Intranet to a secure connection in an external network.

3.2 State of the art

D10 discloses a handoff from a public to a private network and vice versa. It does not deal with secure connections.

D11 concerns the use of a trigger packet having a special format to request "communication path check"-packet generation at the corresponding host.

D12, cited in section VI, discloses the handoff from an Intranet to an external network. Thereby, a VPN tunnel is established within an MIP-tunnel. It also shows the deactivation of the VPN tunnel while maintaining the MIP-tunnel.

D5 and D13, both being cited in section VI, disclose the establishment of a double tunnel (IPSEC-tunnel in MIP-tunnel) in case of handing off from a home to a foreign network.

3.3 The technical problem

The underlying problem can be formulated as to enable switching between a double tunnel and a triple tunnel.

3.4 The invention

In a first embodiment (**Claims 16 and 19**), this problem is solved by:

- receiving a packet,
- determining if said packet is a trigger packet,
- storing said packet in a trigger packet queue, and
- switching between said double tunnel and said triple tunnel,

In a second embodiment (**Claim 13**), this problem is solved by a mobile node comprising:

- an external mobile IP driver receiving information from a first network driver,
- an internal mobile IP driver receiving information from said external mobile IP driver,
- a controller that controls signaling for switching between a double tunnel and a triple tunnel,
- wherein said internal mobile IP driver determines whether said information is an indication that the mobile node should switch from a double tunnel to a triple tunnel and provides data to said controller regarding said indication.

The closest prior art shows no solution for the problem of to enable switching between a double tunnel and a triple tunnel. So, the present solutions, which of course are technically applicable, are neither disclosed nor rendered obvious by any combination of available prior art documents, thereby meeting the requirements of Articles 33(2),(3) and (4) PCT.

The same applies to dependent **Claims 14, 15, 17, 18, 20 and 21**, which relate to further implementing details of the system or method of the independent claims and therefore equally meet these requirement of the PCT.

4 **Fourth group of inventions (Claims 22-31)**

- 4.1 The present application does not meet the requirements of Article 33(2) PCT, because the subject-matter of **Claims 22 and 27** defining the **first alleged subinvention of this group**, is not novel.

With respect to Claim 22, both documents D14 and D15 already disclose a system for preventing a denial of service attack (see D15, paragraph 109) comprising a mobile node communicating with an internal home agent that only transmits internal

mobile IP registration requests through an IPsec tunnel (see D14, page 6, lines 13f, page 7, lines 3-8, see D15, paragraphs 117, 127).

Accordingly all features of independent Claim 22 and of its corresponding method Claim 27 are known from D14 and D15 and their claimed subject-matter is thus not novel within the meaning of Article 33(2) PCT.

- 4.2 The present application does not meet the requirements of Article 33(2) PCT, because the subject-matter of **Claims 24 and 29** defining the **second alleged subinvention of this group**, is not novel.

Concerning Claim 24, the two documents D14 and D15 already disclose a system for preventing leakage of information comprising:

- a mobile node communicating with an internal home agent (see D14, page 6, lines 10-12, 14-16, page 7, lines 6f, see D15, paragraphs 117, 121, 124),
- wherein an internal mobile IP registration reply is not encrypted and at least some other signaling and data packets are encrypted (see D14, page 6, lines 16f, line 21 - page 7, line 2, page 7, lines 17-19, see D15, paragraphs 121, 124, 127, 128).

Accordingly all features of independent Claim 24 and of its corresponding method Claim 29 are known from D14 and D15 and their claimed subject-matter is thus not novel within the meaning of Article 33(2) PCT.

- 4.3 It is furthermore pointed out that even if the above novelty objections were overcome by amendments of a minor nature, the subject-matter of independent **Claims 22, 24, 27 and 29** would still not seem to involve an inventive step (see Article 33(3) PCT), considering that D14 and D15 essentially provides the same solution as the present application.
- 4.4 The dependent **Claims 23, 25, 28 and 30** do not to define any additional features which are appropriate to render the claimed subject-matter new in the sense of Article 33(2) PCT, because the key exchange establishment of the IPSEC tunnel as well as the IPSEC encryption are mentioned in D14 and D15 (see D14, page 7, lines 17-19, 22-24, see D15, paragraphs 93, 139).

4.5 Since the claimed subject-matter is already industrially applied according to documents D14 and D15, the requirements of Article 33(4) PCT are fulfilled by **Claims 22-25 and 27-30.**

4.6 **Concerning Claims 26 and 31 defining the third subinvention of this group:**

State of the art:

D16 discloses a mobile node in a foreign network communicating via firewalls in a demilitarized zone with an home agent in the home network. Therein, the mobile node comprises firewall software filtering packets on validity of an authenticator and on protocol and port numbers, for protecting the home network from outsiders.

D17 similarly describes such a mobile node with firewall filtering on IP source address, protocol and port numbers.

The technical problem:

The problem solved by the third subinvention can be regarded as to prevent false incoming calls from the mobile node.

The invention:

According to independent Claims 26 and 31, this problem is solved by said firewall preventing packets from being accepted as trigger packets, where said accepted trigger packets permit said mobile node to establish an IPsec tunnel with said internal home agent.

The search report therefor cites 2 "A" documents, none of which discloses or renders obvious this invention. So, the present solution is neither disclosed nor rendered obvious by any combination of available prior art documents.

Consequently, the subject-matter of independent Claims 26 and 31 is considered to be novel, inventive and industrially applicable according to Articles 33(2), (3) and (4) PCT.

5 Remarks concerning clarity of the international application:

- 5.1 Contrary to Article 6 PCT, the feature "communicates" in the apparatus **Claim 1** relates to a method-step rather than imposing any clear restrictions on the apparatus itself.
Similar comments apply to other claims (i.e.: **Claim 13**: receiving, that controls, determines, provides, **Claim 22**: communicating, transmits).
In order to meet the requirements of Article 6 PCT, these claims should be recast by formulations like "*means adapted for doing*", "*adapted to do*", "*arranged to do*" or "*means for doing*" in order to make the intended limitations clear.
- 5.2 The method step or associated system component defined in **Claims 26 and 31** is incomprehensible. The reader cannot understand how packets can be accepted and permit the IPSEC tunnel establishment, when the firewall prevents packets from being accepted.
- 5.3 The actual formulation of **Claim 22** leaves the reader in doubt as to whether the mobile node or the home agent transmits the request, thereby rendering the definition of the subject-matter of said claim unclear, contrary to Article 6 PCT.
- 5.4 The present **Claim 12** does not unambiguously define on which claim it depends on, such leaving the scope of the claim unclear. Since Claims 11 and 12 seem to correspond to Claims 9 and 10, it should be dependent upon Claim 11.
- 5.5 Contrary to the requirements (conciseness) of Article 6 PCT, the dependent **Claim 14** is redundant with regard to Claim 13 it depends on.

6 Remarks concerning formal defects in the international application:

- The opening part of the description should have been brought into conformity with the wording of the claims.
- In order to meet the requirements of Rule 5.1.(a),(ii) PCT, the documents D1, D4

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

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and D5 (for the first invention), D6, D7 and D9 (for the second invention), D10, D11 and D12 (for the third invention), and D14, D15 and 16 (for reselective subinventions of the fourth group of inventions) should have been identified in the description and their relevant contents should have been indicated. The Applicant should ensure that it is clear from the description which features of the subject-matter of the independent claims are known from document D1. Additionally it should have been indicated that D5, D9, D12 and D16 do not form pre-published state of the art.

- All the claims should include reference signs in parentheses where features shown in the drawings are referred to (see Rule 6.2 (b) PCT).

- The general "*spirit and scope*" statement in the description at the last paragraph implies that the subject-matter for which protection is sought may be different to that defined by the claims, thereby resulting in lack of clarity (see Article 6 PCT) when used to interpret them. This statement should therefore have been deleted to remove this inconsistency.

- The attention of the Applicant is finally drawn to the fact that, when entering the national phase, the application may not be amended in such a way that it contains subject-matter which extends beyond the content of the application as filed (see Articles of the national law corresponding to Article 34.2(b) PCT like e.g. Article 123(2) EPC).

- In order to facilitate the examination of the conformity of the amended application with the requirements of these Articles, the Applicant is requested to clearly identify the amendments carried out, no matter whether they concern amendments by addition, replacement or deletion, and to indicate the passages of the application as filed on which these amendments are based (see also Rule 66.8(a) PCT).